



Proverbs 20:10

**Diverse weights and diverse measures:
both of them alike are abomination to
the Lord**

Plasma Products

- Coagulation products including Antihemophilic Factor (AHF) for hemophilia treatment
- Albumin for treatment of shock
- Immune Globulin for prevention / treatment of infectious diseases

Definition of Coagulation Unit

The unit of coagulants such as AHF was defined as the level in normal plasma

Coagulation Model

LOBERG™



Percy Sharpener RUBE GOLDBERG (tm) RGI 038

Measurement of Coagulation Factors

- In 1966 there were several assays
- All assays were based on the clotting time of plasma
- Clotting time was measured by visual formation of a clot

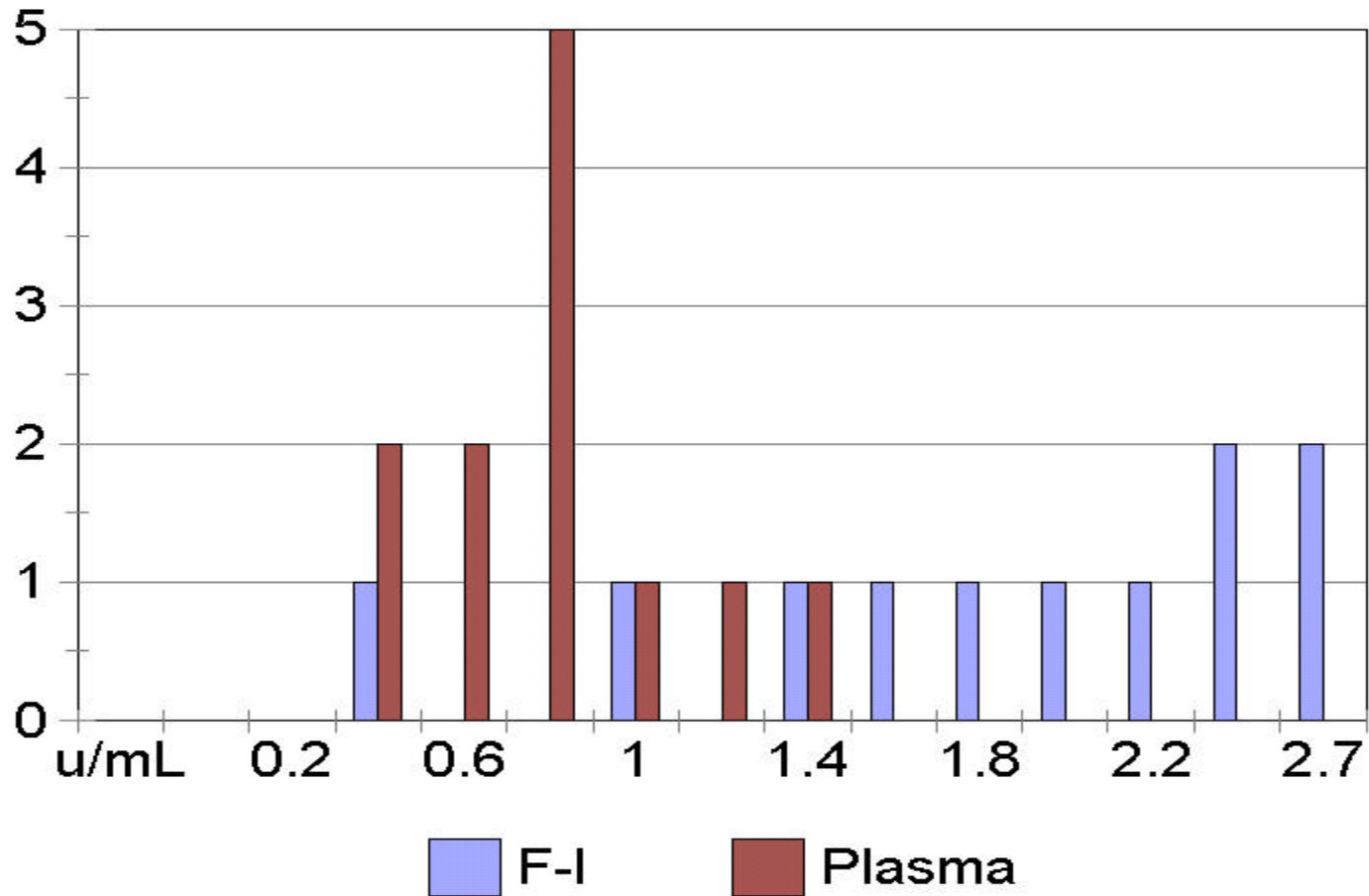
Multiple Laboratory testing(1963)

Samples of dried plasma and Fraction I were sent to expert laboratories for evaluation of AHF compared to the “normal “ in-house plasma

Results of Multicenter Study

- Results extremely variable-CV=50%
- No evidence any one test was more accurate or precise

Multicenter AHF Testing



Suchinsky's Law

When the results from 2 (or more) laboratories disagree, they all cannot be right but they all can be wrong

Sources of Variance

- Pre-analytical variables including phlebotomy, plasma age, blood type and age of donor
- Analytic technique
- Imprecision of endpoint measurement

The Breadth of Biologics Standards

- **International Standards (WHO)**
- **National Standards**
- **Industry Working Standards**
- **Clinical Standards-National and Local**

METRE



Immune Globulin

Used for the prevention and treatment of infectious diseases

- Purity determined by electrophoresis
- Potency determined by antibody titer

Immune Globulin Decay

- Decay did not result in loss of potency, i.e. Antibody titer activity
- Decay results in increased turnover and shortened effect
- Assay developed to detect proteolytic activity (plamin?)

Hypotension with PPF

- Survey for occurrence of hypotension in recipients of PPF
- Identification of cause of hypotension
- Development of assay for PKA
- Establishment of standards for maximum PKA

Hepatitis C and Immune Globulin

- An effective test for hepatitis C was developed
- Immune Globulin prepared by the Cohn method did not transmit hepatitis-possibly because of the presence of viral antibodies
- Production of some Immune Globulin did not include a virus inactivation step

Hepatitis C Screening and Immune Globulin

- Question: Should plasma used to prepare Immune Globulin be free of hepatitis C antibody?

Hepatitis C Screening and Immune Globulin

- **Answer:** In the absence of effective virus inactivation/removal Immune Globulin from screened plasma causes hepatitis C

**The King cannot repeal natural
law**

Epilogue

**FDA shifts biotech drug into main
stream oversight unit**

(NY Times 09/07/02)

Critics say: “they do research”